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ABSTRACT

Through the use of word problems relevant to the field of office occupations education, this workbook presents a concept-oriented approach to competency development in ten areas of basic mathematics: (1) the expression of numbers as figures and words; (2) the addition, subtraction, multiplication, and division of whole numbers, fractions, and decimals; (3) ratios and proportions; (4) percents; (5) measurement; (6) introductory algebra; (7) problem solving; (8) geometry; (9) graphs; and (10) probability and statistics. For each competency area, the workbook presents a series of word problems designed to reinforce student learning and to demonstrate the practical applicability of the mathematical concepts to situations found in office occupations. An answer key for the problems is appended. (JP)

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PERSONAL ACHIEVEMENT

MATHEMATICS

Office Education

Produced by

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JC 800 608

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CURRICULUM MATERIALS DEVELOPED

UNDER THE AUSPICES OF

## FUND TO IMPROVE POST SECONDARY EDUCATION

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COMMUNITY COLLEGE
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1977

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The problems found in this booklet are not meant to instruct you in the field of Office Education. They are practices of the various mathematical concepts and are content oriented to help show the practicality of each concept.

Study each mathematical competency in the general learning packets before attempting these applied problems.

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# Numeration

1. In typing, numbers should never be hyphenated. A large number such as $1,983,645 would be difficult to read if hyphenated. Write the number above in words.

2. Calculating machines are manufactured in models with printout capacities ranging from 999.99 to 999 999 999 999 999.99. Name the place values of the digits to the left of the decimal point.

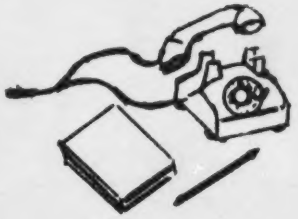
3. General Motors is one of the largest business firms in the United States. At one time they had seven hundred fifty seven thousand two hundred thirty one workers. Write that number in numerals.

4. The Gross National Product for the United States in 1970 was about six hundred forty four billion dollars. Write that number using correct place values.

5. In February of 1977 there were 724,000,000 in bushels of corn still carried over from the fall crops. Write this number in words.

# Addition & Subtraction

1. In the Apex Manufacturing Company some expenditures for one year were as follows: office supplies (pens, pencils, paper, etc.), $2,700; paper towels, etc., $3,422; telephone, $48,460. What is the sum of these three given expenses?

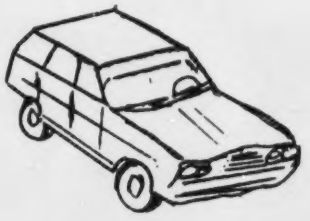


2. A follow-up file is very important to a secretary. These file folders enable one to keep track of important things that must be carried out each day. Most secretaries use 31 folders for each day of the particular month, 12 folders for each month of that year, and one folder labelled "future years". How many folders in all does this file contain?

3. In 1974, the Carson family had the following medical expenses: $300 for medical insurance; $350 on drugs and medicine; $100 on eye examinations; $150 for dental bills; and $350 for other medical bills not covered by their insurance. What was their total medical expense for that year?

4. A stamp affixer machine holds a roll of 500 stamps. In the front of the machine a recorder counts the stamps as they are used. If the recorder reads 206 stamps used, how many remain in the machine?

5. In 1965, automobile manufacturers in the United States produced 7,745,000 cars. If 1969 they produced 8,224,000 cars. What was the increase in car production?



6. Five of the largest business firms in the United States are listed below with the average number of workers employed by each. Answer each of the following questions:

   A. How many more workers are employed by Ford Motor Company than United States Steel?

   B. What is the difference between the largest and smallest number of employees in the 5 companies?

   C. How many employers are employed by the 2 motor companies?

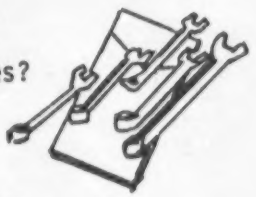
   D. How many workers are employed by all 5 companies?

| | |
|---|---|
| Ford Motor Company | 415,039 |
| General Electric Co. | 400,000 |
| Standard Oil of New Jersey | 757,231 |
| United States Steel | 201,017 |

# Multiplication

1. Mary works full-time and pays $5,800 for child care each year. The Revenue Service allows $400 per month deduction for such an expense. Can Mary deduct all of her child care expense? If not, how much is not deductible?

2. Mr. Jones ordered 210 cases of pocket size wrench sets. Each case contains 24 packages of 12 sets each. How many sets are contained in the 210 cases?



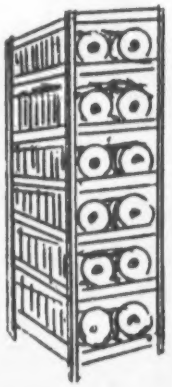
3. Addressograph Multigraph Company introduced in 1975 a duplicator AM2875 which from one loading of up to 100 masters will print both sides in one pass at a rate of 17,000 sheets per hour. If you are in charge of producing 50 copies of a 174 double page report, can the duplicator complete the copies in more or less than one hour?

4. Given 7 digit dollar and cent numbers in tabular form, a student should be able to demonstrate the ability to produce a three-column acceptable copy at the rate of 150 digits a minute for three minutes without error. How many total digits is this in the three minutes?

# Division

1. An elaborate type of postage meter will stamp and seal letter mail at the rate of 150 pieces a minute. How long will it take to process 36,000 letters?

2. Electric Wastebasket Corporation produces a compact paper shredder which can shred 2000 lbs. of paper per hour. If your company destroys 92,000 lbs. of paper a month, how many hours will it take? How many hours a day would this be if evenly distributed over a month of 23 work days?



3. Aura Steel Products sells storage units for computer tape reels. If each unit stores 504 tapes per section, how many storage sections should your company order to plan for new storage facilities for 32,256 reels?

4. In Aetna Life and Casualty's 675 field offices, a waste of $325,000 in overpayment of postage was found to exist. To the nearest dollar, how much would this average per office if evenly distributed throughout the 675 offices?

5. The Baker Company has a computerized payroll department. The computer has the capacity of processing 1,750 payroll checks per minute. Calculate the computer time necessary to process 27,636 employee checks.

# Introduction To Fractions

1. Private pension plans are one source of retirement income for many people in the United States. In 1970, 32.2 million people were covered by such plans. Write 32.2 million using our base ten system.

2. In 1965, there were 20,900,000 persons receiving social security benefits. Write that number of people using a decimal and expressed in millions.

3. In 1970, 26,400,000 people in the United States received social security benefits. If the population of the United States was approximately 210 million at that time, what fractional part of the population were receiving social security benefits? (Express as a fraction in reduced form.)

4. A wholesale fruit dealer bought a carload of apples weighing 2,758 lbs. After sorting, it was discovered that 217 pounds were spoiled. Express the fractional part that was spoiled as a common fraction and a decimal fraction (round to the nearest hundredth).

5. In business, amounts of money are usually rounded to cents.

   Example: $23.354 would be just $23.35 since the 4 in the thousandths place is less than half, it's dropped. If it were 5 or more, it would be rounded up another cent.

   Round each of the following to the nearest cent:

   $28.543

   $127.057

   $2,374.009

   $2.951

# Fractions, + −

1. Fred worked the following hours per day during one week: $4\frac{1}{4}$, $6\frac{1}{3}$, $7\frac{1}{2}$, $5\frac{1}{8}$, and $10\frac{3}{4}$. How many total hours did he work during the week?

2. The Freeden Dress Shop has $1{,}326\frac{1}{2}$ square feet of floor space. There are three departments: dresses, sportswear, and lingerie. The dress department uses $527\frac{5}{8}$ square feet and the sportswear department uses $512\frac{3}{16}$ square feet. How many square feet are used by the lingerie department?

3. A freight car was $\frac{3}{16}$ full. Freight was added to bring the load to $\frac{14}{15}$ of its total capacity. What fraction of the car's capacity was added?

4. In Joe's desk he keeps 5 reams of different typing paper. At the present time he has blue $\frac{3}{5}$ ream, green $\frac{1}{2}$ ream, pink $\frac{2}{3}$ ream, yellow $\frac{1}{3}$ ream and white $\frac{1}{6}$ ream. How much paper does he have in all?

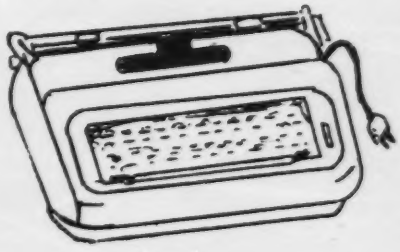
5. In the last month Jill has been keeping a record of the amount of gas she has purchased. The four times recorded, the pump readings were $10\frac{3}{10}$ gallon, $14\frac{6}{10}$ gallon, $12\frac{2}{10}$ gallon, and $15\frac{7}{10}$ gallon. How many total gallons of gas does this represent?

# Multiplying Fractions

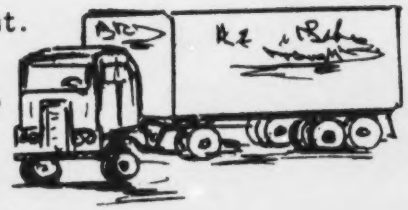
1. A secretary traveling abroad with a member of her company's firm needed a passport photograph. The size required was between $2\frac{1}{2}$" x $2\frac{1}{2}$" and 3" x 3". The area of such a photo is length times width. What is the area of the smaller size photo?

2. The assistant manager of a local firm is planning to buy a new home. It is normally recommended that the cost of a home should not exceed $2\frac{1}{2}$ times your annual income. If the manager's annual income is $24,000, what should be the maximum cost of a new home?

3. One year a large company was paying $10 on each typewriter for maintenance contracts. The following year they discontinued the contracts on half of their 120 typewriters and kept records on the repair costs of those not covered by contracts. They discovered that this record showed a savings of $\frac{2}{3}$ of the cost of the contract group. What was the cost for maintenance on each group of typewriters?

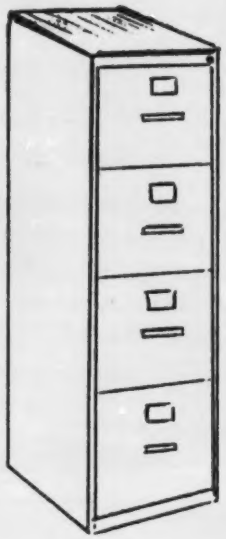


4. Trucking freight rates are calculated on the basis of a minimum weight of 100 pounds. For instance, 60 pounds would cost the same as 100 pounds. 160 pounds would be $1\frac{1}{6}$ the price of a 100 pound shipment. If 100 pounds costs $4.20 to be shipped railroad freight, what would be the cost of shipping 160 lbs?



5. An office is having some special posters printed with the top line being in 120-point type. A point of type is approximately $\frac{14}{1000}$ of an inch. How many inches are there in 120 points?

6. A four-drawer file cabinet contains "follow blocks" $\frac{3}{4}$ inches thick used for spacing file folders. Each drawer has an average of 3 such blocks. How much total space is wasted in the four drawers?



# Dividing Fractions

1. The classified advertising columns of a daily newspaper is six-point type. A point of type is approximately $\frac{14}{1000}$ of an inch. Approximately how many points would be in a two inch wide classified column?

2. Many items purchased in stores today come in more than one size. It is wise to always check to see which size gives the most for your money. A tube of tooth paste at one time came in the following sizes for the given price. Determine the cost per ounce for each and decide which is the best buy.

$7\frac{3}{4}$ oz. for \$ .79

$3\frac{1}{4}$ oz. for \$ .43

3. How many pieces of masking tape $3\frac{3}{8}$ inches long can be cut from a roll 54 feet long if nothing is wasted during cutting (change 54' to inches)?

4. An office worker was able to complete $16\frac{2}{5}$ order forms in one hour and was able to complete $54\frac{2}{3}$ forms before breaking for lunch. How many hours did he work that morning?

# Addition & Subtraction Decimals

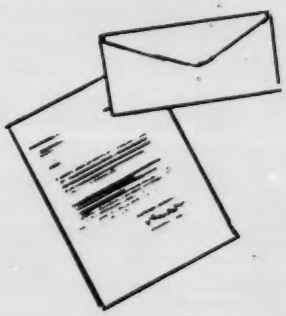
1. A chemical firm uses its copy machines for 200,000 reports, letters, and the like each year. With last year's older models, each copy cost 4.6¢ each. This year with new machines and revised organization of their use, each copy costs only 1.6¢ each. How much was saved on each copy?

2. Janet has signed up to buy an E-bond each month. The cost of the bond is $18.75 and is to be deducted from her monthly paycheck of $375.00 (after other usual deductions). What will be the amount of her monthly paycheck?

3. An order being shipped by a merchandising company amounts to $75.50 plus freight charges of $9.35 pre-payed. What is the total amount of the invoice?

4. The following chart shows the breakdown of the total average cost of writing a business letter. What would be the total cost of a letter?

| | |
|---|---|
| Dictator's time | $ .42 |
| Stenographic cost | .92 |
| Non-productive labor | .20 |
| Fixed charges | .60 |
| Materials | .07 |
| Mailing cost | .13 |
| Filing cost | .09 |



5. The chart below shows the approximate cost of a business letter during the years 1953 to 1966. Find the increase in cost between each of the listings given.

| | |
|---|---|
| 1953 | $1.17 |
| 1960 | 1.83 |
| 1962 | 1.97 |
| 1964 | 2.32 |
| 1966 | 2.44 |

6. The data given below represents the amounts for which checks were drawn on the account of a small company during one month. Find the total amount withdrawn and determine the balance in the account if the balance from the previous month had been $756.50.

| | | | | |
|---|---|---|---|---|
| 7.37 | 60.95 | 12.50 | 11.75 | 35.00 |
| 21.00 | 117.36 | 8.36 | 21.53 | 25.00 |
| 50.47 | 5.00 | 6.00 | 25.00 | 10.24 |
| 3.95 | 25.00 | 57.48 | 11.94 | 16.78 |

# Multiplying Decimals

1. Each employee at a large industrial plant uses automatic punch time cards to record their work hours. Harry King's record last week showed that he worked only 34.5 hours. If his hourly salary was $4.30, what would be his salary for that amount of time?

2. Railroad freight shipment rates within the State of Iowa are a minimum of $10.49. The "Fix-It Company" wishes to ship machine parts weighing 250 pounds at $5.51 per 100 pounds. What would be the cost of such a shipment?

3. Martha has been working overtime in order to complete some special reports. She is to be paid time and a half for all hours in excess of her usual 40 hours week. If last week she worked a total of 52.5 hours and is paid $3.25 per hour, what would be her salary for that week?

4. Last month Janet worked 12 hours at her "work-study" job tutoring mathematics students. She received $2.85 an hour. How much did she earn last month?

# Dividing Decimals

1. A special offer was made for employees of the Mark Parker Fashion Company. For each blouse purchased at the regular price of $12.98 the second blouse could be purchased at half price. What was the cost of Jane's 2 new blouses?

2. If the minimum cost of a railroad freight shipment is $10.49, and the cost of $5.51 for 100 pounds, what is the maximum number of pounds that can be shipped for the minimum charge?

3. Today's coffee prices are very high and we all think carefully before making our purchase. If a pound (16 oz.) can of coffee sells for $4.64, what is the price per ounce?

4. An office building has 10,356 square feet of rental space for which it receives a gross annual rental of $25,890. What is the annual rent per square foot?

# Ratio and Proportion

1. The law office of Hays, Hays, and Merrick uses both normal typing paper and legal size paper in a ratio of 5 to 3. If in one year 100 reams of normal typing paper was used, how many reams of legal size paper was used?

2. Personality is the largest single factor in the success as a secretary. A recent survey showed that three out of every four secretaries that were discharged from their positions were tactless and irritable. If 90 office secretaries were discharged, how many were discharged for personality and related reasons?

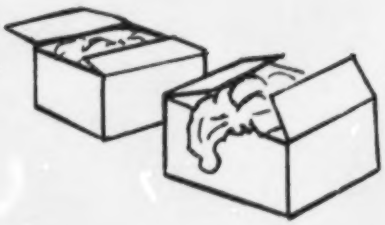
3. The new IBM copy machine Series III model 20 not only makes duplicate copies, but also makes such copies in reduced size. If a chart 7"x 10" drawn on a normal sheet of typing paper is reduced in size so that the shortest dimension is 5", what will be the longer length?

4. Coffee prices have increased during this last year. An example is Taster's Choice Freeze-Dried instant which sold for $2.79 for an 8 oz. jar about 6 months ago while today the same jar sells for about $4.50. If a one pound can of regular grind has increased in price proportionately and is now $4.00, what would have been the price 6 months ago?

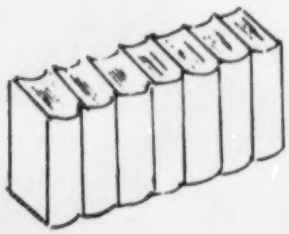
5. A machine that produces 525 units in a five day week at 40 hours per day can produce 63 units in what length of time?

# Percent

1. A secretary gave used clothing to her church. She estimated the original cost of the clothing at $525. If the Revenue Service allows 20% of the original value as tax deductible, how much can she list as a deduction on her tax return?



2. A secretary for a local doctor found a legal tax deduction for her employer. A collection of medical journals were bound and donated to the hospital. Their value including subscription costs and binding costs was $1,500. He was allowed $414.50 deduction on his tax return. Approximately what percent of the $1,500 was the deduction? (Answer to the nearest percent.)



3. A recent survey of 1,500 subscribers to "The Creative Secretary" shows the following information concerning the subscribers' employers: 26% work for manufacturers, 14% for professional people, 13% for service organizations, while 8% work for non-profit agencies. The rest work for retail establishments, banks, etc. What percent work in the last group?

4. In the above problem, find how many subscribers work for employers in each of the five divisions described.

5. Many sales persons are paid a commission on their total sales as well as receiving a base salary. Complete the following table for several company employees.

| SALESMAN | Total Sales | Comm. Rate | Comm. | Salary | Total Earnings |
|---|---|---|---|---|---|
| P. J. Baker | $ 8,604 | 5% | $ | $ 750 | $ |
| C. R. Jones | $12,500 | 4% | $ | $ 980 | $ |
| R. M. Porter | $11,100 | 4½% | $ | $ 895 | $ |

6. A survey of 76 large corporations showed an average turnover of 4,000 clerical workers each year. Carelessness was given as the reason for discharge in 14% of the cases. How many of the 4,000 turnovers were due to carelessness?

7. Items distributed by Hark & Lewis Company are sold at a trade discount of 15% from list prices. On invoices that are paid within ten days an additional cash discount of 2% from the net amount of the invoice after taking off the 15% trade discount is given. The total of list prices on one order is $850. What amount would the customer pay if paid within ten days?

8. A large food market sold $1,225,000 worth of food and related items last year. Their profit for the year was $79,625. What was their percent of profit?

9. In 1970 a young man helped out part-time in a shipping company and received $15 each week. The amount of his check was only $14,28 because of the deduction for social security. At that time, what was the percent of deduction for social security?

10. In typing a final copy from a rough-draft, a typing student should be able to produce a finished copy at the rate of 77% of their straight copy speed for a duration of 20 minutes. If your straight copy speed is about 62 wpm, approximately what speed would you need to comply with each of these requirements?

11. A retail store was permitted to deduct $272 from an $850 invoice because of damaged merchandise. Calculate the percent of the discount allowed.

# Measurement

1. Janet kept a time card for the five work days each week. One week she recorded the following hours:

| DAY | ARRIVAL | DEPARTURE |
|---|---|---|
| Monday | 7:56 am | 5:33 pm |
| Tuesday | 7:49 am | 6:30 pm |
| Wednesday | 7:58 am | 5:35 pm |
| Thursday | 8:15 am | 5:00 pm |
| Friday | 8:05 am | 4:00 pm |

Assuming she took one full hour for lunch each day, how much time was spent at her job?

2. An $8\frac{1}{2}$ x 11" sheet of typing paper has what dimensions in centimeters (metric system)?

3. Change $5\frac{5}{6}$ feet to feet and inches.

4. A young couple wants to make a bookshelf using boards and bricks. The shelves are to be 30" long. They have four boards of the following lengths:

   3 yds. - 1 ft. - 6 inches
   2 yds. - 2 ft. - 4 inches
   1 yd. - 2 ft. - 2 inches
   2 yds. - 1 ft. - 11 inches

   How many shelves can they cut from the four boards?

5. Two feet, six inches is what part of a yard?

6. Two hundred fifty centimeters is what part of a meter?

# Introduction To Algebra

1. Using the formula I = PRT, find the amount of simple interest which will be charged to borrow:

   I = Interest
   P = Principal
   R = Rate of Interest
   T = Time in years

   A. $750 at 9% for 2 years

   B. $378 at 6% for 72 days

2. $C = \frac{9}{5}(F - 32^{0})$ -- This formula is used to change our normally used Fahrenheit temperature into Celsius scale. If an office is kept at $68^{0}$ F, what would be the temperature in Celsius?

3. The length of the longest side of a right triangle can be found by use of the Pythagorean Theorem: ($c^2 = a^2 + b^2$), where c is the longest side and a and b are the other two sides. Find side c in the triangle at the right (round your answer to the nearest foot).

4. An office storage room contains 36 cartons. There are six times as many cartons of typing paper as cartons of file folders and twice as many cartons of envelopes as file folders. How many of the 36 cartons contain file folders, envelopes, and typing paper?

# Problem Solving

1. For years, two clerks had been spending approximately 3 hours each week checking invoices. Two-thirds of this time was spent dealing with invoices totalling less than $50. During one month (4 weeks) the clerks found only $33 of errors from the less than $50 invoices. At $3 per hour for their time, was the gain of $33 worth the time and expense? Why?

2. The Revenue Service has certain rules involving expenses for travel for sales employees. One way that is acceptable is a maximum "per diem" allowance of $44 and mileage allowance of no more than 15¢ per mile. What would be the amount allowed in travel expenses for a garmet sales person for a ten day trip covering 3,200 miles?

3. To find your score on a "transcribing test", use the following procedure: First subtract the number of transcribing errors from a perfect score of 100. Multiply the number of minutes over 40 minutes by 2 and deduct this product. Find your score if you make 6 transcribing errors and take 46 minutes to complete the test.

4. The first office employee to arrive each morning (guy or gal) at the Murry Manufacturing Company has the responsibility of making coffee for the day. If the large coffee pot held 30 cups of coffee and 8 ounces of regular grind coffee was needed for an ideal blend, what was the approximate cost per cup of coffee if a 3 pound can sells for $11.52?

# Introduction To Geometry

1. A common card file uses cards that are 3" x 5". What is the area of such a card?

2. A community college has a bulletin board 30" x 30" that is used for posting job openings. A 3 x 5" card is used for giving all needed information concerning the job. What is the maximum number of such cards that can be posted on the bulletin board?

3. One microfiche reader has inter-changeable viewing screens. One screen is 11" x 8½" and the other is 14" x 11". Find the area of each screen (A = lw) and determine how many square inches the largest screen is.

4. Dr. John Newton's old office was rectangular in shape, with sides 16'5" and 11'10". His new office measures 19'4" by 12'3". How many more square feet of space does his new office contain? (Change inches to fractional parts of a foot.)

5. Locate an unused rectangular table and find its perimeter in feet and inches. Now re-measure the table using the metric system and give the perimeter in meters and centimeters.

6. A sheet of poster board 18" x 24" is to be divided into right triangles each half of a square that is 3" x 3".

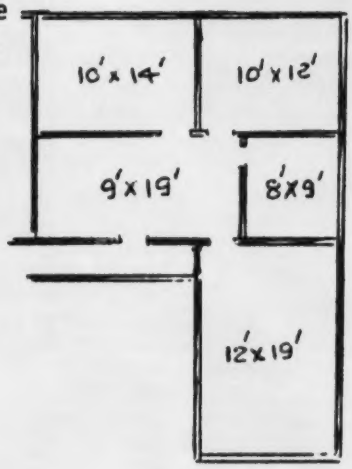
   A. How many triangles can be cut from the sheet?

   B. What is the area of each triangle?

   C. Multiply the number of triangles by the area. Does this total area agree with the area of the whole sheet?

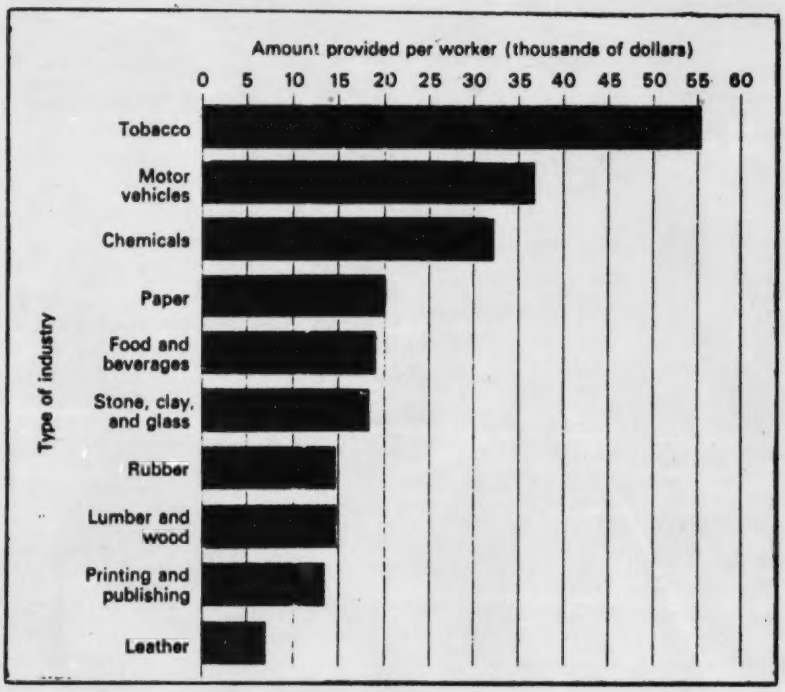
7. A construction company's mobile office's water cooler contains a glass water jug 18" high and a diameter of 14". What is the volume of the jug? ($\pi = \frac{22}{7}$) (Give the volume in cubic inches.)

8. Office space in a Cedar Rapids building rents for $3 per square foot per month. Find the approximate rent for a month for the office suite illustrated at the right.



# Graphs

1. The graph below shows the amount of capital invested by different industries for each worker employed. Approximate the amount invested for each worker for each of the industries.




2. Draw a bar graph showing the following information:

Average Income in 1968
of
Male Workers by Occupation

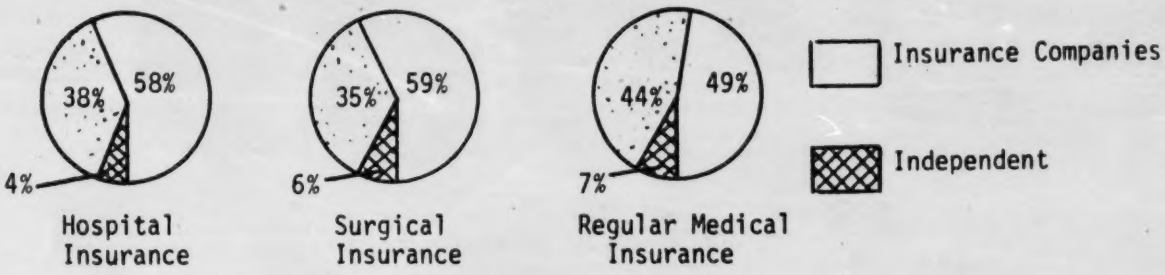
| | |
|---|---|
| Self employed professionals | $16,300 |
| Salaried professionals | 9,600 |
| Sales workers | 7,200 |
| Clerical workers | 7,000 |
| Service workers | 4,600 |
| Laborers | 4,000 |

3. The three circle graphs shown below represent different types of medical insurances.

   A. Which type of organization provides the best coverage for hospital expenses?

   B. Which type provides the best surgical expenses?

   C. For each $500,000 in regular medical expenses in the United States, what amount is covered by Blue Cross-Blue Shield and similar plans?

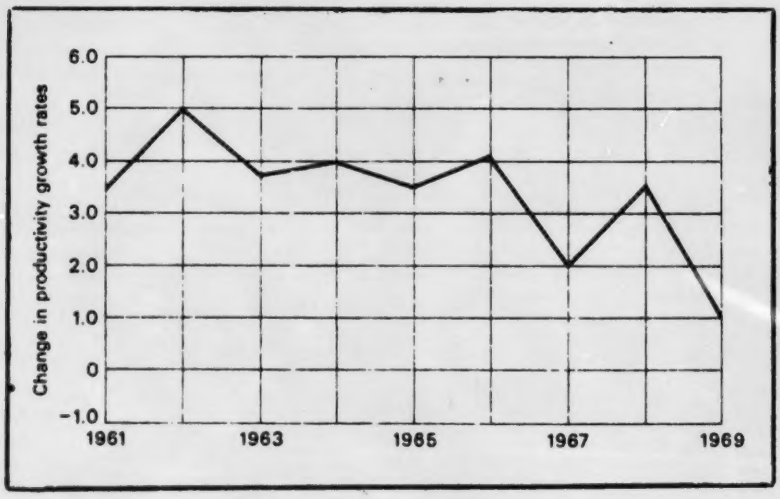



Hospital Insurance | Surgical Insurance | Regular Medical Insurance

4. The line graph below (from the U. S. Department of Labor) shows the rate of increase (in %) in productivity in the United States each year from 1961 through 1969.

   A. Which year did the rate of increase reach its peak?

   B. What was the percent rate of increase in productivity in 1965?



5. Make a line graph to illustrate the following information:

INVESTMENTS BY BUSINESS FIRMS

(In Billions of Dollars)

| | |
|---|---|
| First Year | $ 50 |
| Second Year | $ 50.3 |
| Third Year | $ 63.8 |
| Fourth Year | $ 67.4 |
| Fifth Year | $ 66.1 |
| Sixth Year | $ 56.6 |
| Seventh Year | $ 72.4 |

6. A large company recorded its monthly sales as follows: Make a bar graph to show each month's sales.

| | |
|---|---|
| January | $ 119,245.89 |
| February | 98,420.56 |
| March | 108,514.64 |
| April | 86,409.40 |
| May | 112,509.32 |
| June | 111,540.87 |
| July | 101,309.55 |
| August | 110,502.70 |
| September | 78,500.75 |
| October | 84,740.48 |
| November | 66,879.00 |
| December | 91,450.19 |

# Probability & Statistics

Average or Mean (problems 1 - 5) is found by the following method:

$$\text{Mean} = \frac{\text{Sum of the figures}}{\text{Number of items}}$$

1. A survey which included seventy-six large corporations showed that in their offices there was a total annual turnover of approximately 304,000 stenographic, secretarial, etc., workers. What is the average turnover for each of the corporations?

2. The possible maximum score on a "Self-Rating Personality Test for Secretaries" is 150, and the possible minimum score is 50. What would be the average score?

3. In a secretarial typing test of 28 sentences, a total of 100 punctuation marks are to be inserted. What is the approximate average of punctuation marks in each sentence?

4. What was the average profit as a percent of sales for the industries listed below:

| INDUSTRY | PROFIT AS A PERCENT OF SALES |
|---|---|
| Petroleum refining | 9 |
| Measuring & scientific equipment | 9 |
| Chemicals | 7 |
| Publishing and printing | 7 |
| Paper and wood products | 6 |
| Motor vehicles and parts | 5 |
| Textiles | 4 |
| Food and beverages | 3 |

5. Last year Barker's Inc., had a sales of $12,637.48. What was the average monthly sales?

6. The Median is the central or the middle point of a series of numbers after first listing the numbers in order beginning with either the smallest or the largest.

Find the median of the following sales records:

| | |
|---|---|
| Art Morton | $ 6,845.25 |
| Jerry Alton | 8,374.50 |
| Mary Taylor | 7,516.00 |
| Jane Parker | 5,750.75 |
| Chris Olden | 9,320.00 |

7. The Mode is the item that appears most frequently in a distribution.

Find the mode of the following hours worked in one week by the workers in a large office typing pool:

37, 42, 40, 38, 42, 37, 48, 37, 41, 48, 42, 57, 23, 45, 47, 39, 40, 48, 40, 42, 51, 37, 40, 43, 42, 40, 39, 37, 50

## Numeration

1. One million, nine hundred eighty-three thousand, six hundred forty-five
2. Hundred-trillions, ten-trillions, trillions, hundred-billions, ten-billions, billions, hundred-millions ten-millions, millions, hundred-thousands, ten-thousands, thousands, hundreds, tens, ones
3. 757,231 workers
4. $644,000,000,000
5. Seven hundred twenty-four million

## Addition & Subtraction

1. $54,582
2. 44 folders
3. $1,250
4. 294 stamps
5. 479,000 cars
6. a) 214,822 workers
   b) 556,214 workers
   c) insufficient data given
   d) 1,773,287 workers

## Multiplication

1. No. $1,000
2. 60,480 sets
3. less than
4. 450 digits

## Division

1. 240 min. (4 hrs.)
2. 46 hrs.; 2 hrs./day
3. 64 sections
4. $481
5. 15.8 hours

## Intro. to Fractions

1. 32,200,000
2. 20.9 million persons
3. $\frac{22}{175}$ people
4. $\frac{31}{394}$; .08 spoiled
5. $28.54; $127.06; $2,374.01; $2.95

## Fractions + -

1. $33\frac{23}{24}$ hours
2. $286\ \frac{11}{16}$ sq. ft.
3. $\frac{179}{240}$
4. $2\frac{4}{15}$ reams
5. $52\frac{4}{5}$ gal.

## Multiplying Fractions

1. $6\frac{1}{4}$ sq. in.
2. $60,000
3. contract group = $600
   non-contract group = $200
4. $4.90
5. $1\frac{17}{25}$ in.
6. 9 in.

## Dividing Fractions

1. 143 points
2. $.10/ounce; $.13/ounce
   largest is cheapest
3. 192 pieces
4. $3\frac{1}{3}$ hours

## Addition & Subtraction Decimals

1. 3¢
2. $356.25
3. $84.85
4. $2.43
5. $.66
   $0.14
   $0.35
   $0.12
6. 532.68
   223.82

## Multiplying Decimals

1. $148.35
2. $13.78
3. $190.94
4. $34.20

## Dividing Decimals

1. $19.47
2. 190 lbs.
3. $.29/ounce
4. $2.50/sq. ft.

## Ratio & Proportion

1. $\frac{5}{3} = \frac{100}{x}$ x = 60 reams
2. $\frac{3}{4} = \frac{y}{90}$ y = 68 secretaries
3. $\frac{7}{10} = \frac{5}{x}$ $x = 7\frac{1}{7}$ "
4. $\frac{2.79}{4.5} = \frac{x}{4}$ x = $2.48
5. $\frac{525}{200} = \frac{63}{x}$ x = 24 hours

## Percent

1. x = $105
2. x - 27.6%
3. 39%
4. 26% 390 people
   14% 210
   13% 195
   8% 120
   39% 585
5.

| Commission | Total |
|---|---|
| $430.20 | $1180.20 |
| 500.00 | 1480.00 |
| 499.50 | 1394.50 |

6. 560 workers
7. $708.05
8. 6.5% profit
9. 4.8%
10. 48 w.p.m.
11. 32%

## Measurement

1. 41 hrs. 35 min.
2. 21.6 cm
   27.9 cm
3. 5 ft. 10 in.
4. 12 shelves
5. $\frac{5}{6}$ yd.
6. $2\frac{1}{2}$ m

## Introduction to Algebra

1. a) $135
   b) $4.54
2. incorrect formula
3. Impossible, no picture
4. 4 cartons file folders
   8 cartons envelopes
   24 cartons typing paper

## Problem Solving

1. If 2 clerks work 3 hrs/wk. total, yes
   If 2 clerks work 6 hrs/wk. total, no
2. $920
3. Score of 82
4. 6.4¢/cup

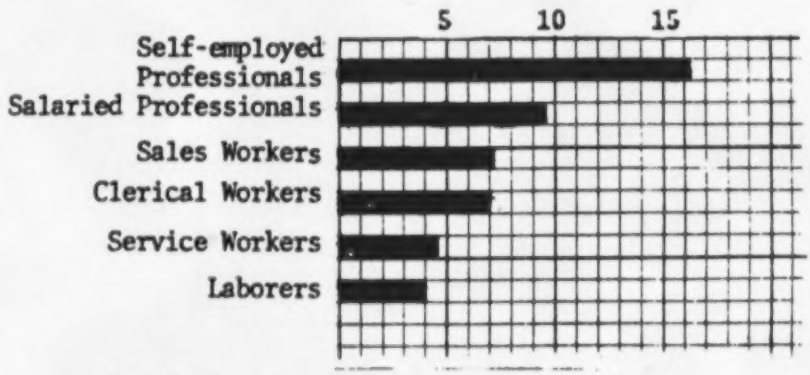
## Intro to Geometry

1. 15 sq. in.
2. 60 cards
3. 93.5 sq. in.
   154 sq..in.
4. 42.6 sq. ft.
5. varies
6. a) 96 triangles
   b) $4\frac{1}{2}$ sq. in.
   c) yes
7. 2772 cu. in.
8. $2193/mo.

## Graphs

1. Tobacco $55,000
   Motor vehicles $36,000
   Chemicals $32,000
   Paper $20,000
   Food & beverage $19,000
   Stone, clay, glass $18,000
   Rubber $14,900
   Lumber & wood $14,900
   Printing & publ. $13,000
   Leather $7,000

2. Average Income in 1968 (in $100)

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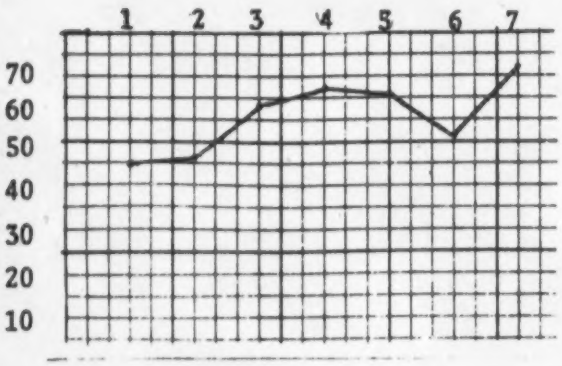
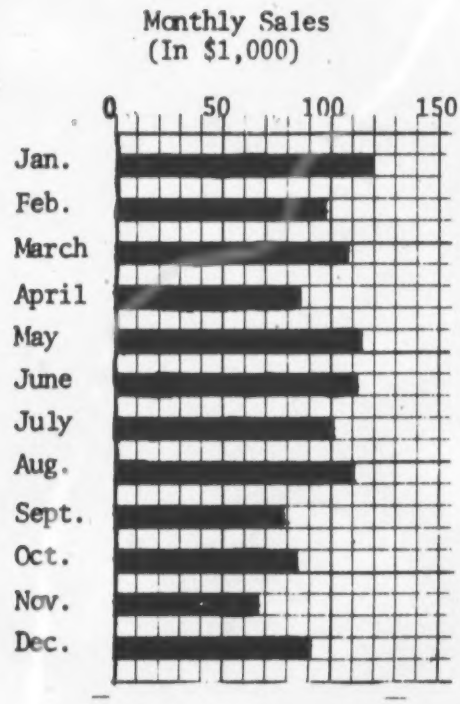
3. a) Insurance Cos.
   b) Insurance Cos.
   c) $220,000
4. a) 1962
   b) $3\frac{1}{2}\%$

5.




6.




## Probability & Statistics

1. 4,000 people
2. Insufficient information
3. 3-4/sentence
4. $6\frac{1}{4}\%$
5. $1,053.12/mo.
6. $7,516
7. 37, 42, 40 (tri-modal)